

POETRY.

We kind to the Little One.

We know not what we look upon,
When we behold a child,
Its face may sickly look, and
Be full and fair and mild.

The bright-eyed one may die the first,
Die life the last again,
Or live to be stately old,
By working till to death.

The feeble one may grow up strong,
And do, to please his own,
Such works of good, while living long,
As time allows him.

The right of genius for our trace
In childhood's early years,
A little thing of time or place
May bring great joy or tears.

Oh! such a thought! that some should dare
To injure them by their dress,
And mock the poor—the Father's care!
Such wrong can we express!

It makes their way extremely hard;
The bad seems great to bear.
It is increased, have regard
For those—what they want.

Your children teach, urge them, and all
To sympathize with each,
Lest they make this evil still.
One cause of the same.

Parents would come in many ways:
In thoughts that their lot
Be made more dismal in happier days
If God permitted it not.

(On all their future course the power
Of influence is shown,
And other deathless last dying hour;
He end is never known.

Then kindly treat the little one,
So doing we are wise,
God guides the works so slight begin,
To teach in the schools.

The Subterranean Forces, Volcanoes and Earthquakes.

BY ANTHONY MCKEELEY.

While admitting the existence of these laves, or Mediterranean Seas of lava, it is difficult to imagine how these boiling substances can rise from the depths at which they lie, and after having subsided, or shaken, the solid crust, escape at the surface either in the shape of viscous domes or in living fluid currents. It is well known, it is true, that water plays an important part in volcanic eruptions, for the enormous volumes of clouds which almost constantly emanate from active craters are composed in the proportion of 300-1000ths of watery vapors, and they lift up, in their succeeding rush from the bottom of the abyss, whirls of ashes and blocks of scoria. The chemical analyses of Menier, Sainte-Claire, Deville, and Fouqué have, besides, proved in the most unquestionable manner that all the salts and gases ejected by volcanic eruptions are identical with those formed by the decomposition of salt water. It can, therefore, be safely admitted, at least for the volcanoes that are situated in the vicinity of the sea, that the water of the ocean, transformed into vapor, acts directly in the phenomena of the ascension and explosion of lava. But if this can be henceforth considered a fact well established by science, still we do not know the manner in which salt water penetrates into the subterranean abysses, to be changed into vapor and expelled through the volcanic issues.

Even admitting, for the sake of argument, that the temperature increases constantly downwards in the waters communicating through subterranean channels with the sea, then, at a depth of 3,000 yards they will have a heat of 100° Centigrade, will not be transformed into vapor, for the enormous pressure they have to sustain will keep them in their liquid state. But when the expansive force of the water is sufficiently powerful to counterbalance the weight of the superstrata of liquid masses and to vaporize, why should this vapor circulate under the terrestrial foundations, and lift them up in volcanic cones, when the natural result of its victory over the masses of water should be simply to divert its course towards the bottom of the sea, from whence it proceeded?

This is a question not easily to be answered in the present state of science, and one of the chief merits of the geologists is to confess their ignorance in the matter. The discoveries daily made by physiologists and chemists, and which have shown as the immense activity of the vapor of water in volcanic eruptions will, doubtless, one day, elucidate how this activity is exercised amongst the subterranean rocks. However, it may be considered an established fact that the cones of the volcanoes are not formed, was believed by Humboldt and Leopold de Buch, from a sort of turgescence of the soil. One of the great arguments they brought forward in support of their hypothesis was the appearance of the Javello Volcano suddenly rising to a height of 500 yards; but this abrupt birth of the Mexican volcano is nothing but an Indian legend, which is not to be credited without the geological observations made by several naturalists since Humboldt's visit to Mexico.

If science can not yet discern how the pressure of the imprisoned vapors can break the soil and expel the lava and ashes, it has been no more able to explain how this same pressure shakes the terrestrial crust when an earthquake takes place. By the means of instruments invented and improved by observers, it is now possible to measure the magnitude or intensity of the concentric undulations produced by each shock, and under certain circumstances it is even possible to establish, in an approximate manner, their depth, but the cause is generally unknown.

In an approximate manner, their depth, but the cause is generally unknown. It is also a matter of great doubt whether all the strong vibrations of the soil owe their origin to volcanic disturbances, and the question has arisen in the minds of many geologists, if, instead of being attributed to abortive efforts of explosive, inundation nature, they can not be

referred to causes completely differing from those which uplift the cones of volcanoes and pierce their craters. This last opinion has not with many geologists advocates. Prominent among the geologists who deny that there is any connection between the earthquakes and the volcanic phenomena, is Mr. Otto Vogler and those who have read his books can not help being struck by the force and the number of the arguments advanced by him in favor of his theory, and against that of Humboldt, Leopold de Buch, and Elie de Beaumont, which has hitherto been universally adopted.

However, there is a certain number of earthquakes, the volcanic origin of which can be directly ascertained, independently of any theory. For instance, when the sides of such a mountain as Elba, or Mauna Kea, burst open to allow passage to a stream of lava, if, at the same time, the soil is strongly shaken, it is evident that the earthquake is caused by the eruption of the volcano; and the shock, confined to the locality, is perfectly analogous to that produced by the explosion of a mine, or of a powder magazine. When the fissure is of considerable length, and the broken crust of the volcano very thick, the shock is violent, and is carried onward in long oscillations in the neighboring countries; but when the rocks of the volcano, slowly thinned and melted by the rising lava, easily yield to the pressure that bursts them open, then the explosion is only felt in the immediate neighborhood of the fissure. At the time of the last great eruption of Elba, the tremblings of the soil, which coincided with the formation of the crevices, were generally very slight, and the strongest perceptible in the city of Aci-Baile, was confined to the Elba region. There are several instances of volcanic eruptions related in history, during which the soil was hardly convulsed, or shaken, the solid crust, escape at the surface either in the shape of viscous domes or in living fluid currents. It is well known, it is true, that water plays an important part in volcanic eruptions, for the enormous volumes of clouds which almost constantly emanate from active craters are composed in the proportion of 300-1000ths of watery vapors, and they lift up, in their succeeding rush from the bottom of the abyss, whirls of ashes and blocks of scoria. The chemical analyses of Menier, Sainte-Claire, Deville, and Fouqué have, besides, proved in the most unquestionable manner that all the salts and gases ejected by volcanic eruptions are identical with those formed by the decomposition of salt water. It can, therefore, be safely admitted, at least for the volcanoes that are situated in the vicinity of the sea, that the water of the ocean, transformed into vapor, acts directly in the phenomena of the ascension and explosion of lava. But if this can be henceforth considered a fact well established by science, still we do not know the manner in which salt water penetrates into the subterranean abysses, to be changed into vapor and expelled through the volcanic issues.

Even admitting, for the sake of argument, that the temperature increases constantly downwards in the waters communicating through subterranean channels with the sea, then, at a depth of 3,000 yards they will have a heat of 100° Centigrade, will not be transformed into vapor, for the enormous pressure they have to sustain will keep them in their liquid state. But when the expansive force of the water is sufficiently powerful to counterbalance the weight of the superstrata of liquid masses and to vaporize, why should this vapor circulate under the terrestrial foundations, and lift them up in volcanic cones, when the natural result of its victory over the masses of water should be simply to divert its course towards the bottom of the sea, from whence it proceeded?

Those who believe that volcanoes act as safety-valves, and that the earth, present, in favor of their theory, some facts which have become legendary, but the reality of which is far from being certain, as Otto Vogler has thoroughly proved. Thus, at the time of the earthquake at Lisbon, Venzuela, which was ejecting large masses of vapor, "sudden" absorbed the cloud it had thrown out, and the torrent of lava that was streaming from its side was all at once stopped;" but these sweeping assertions are founded upon a somewhat obscure sentence of Kant, in his narrative of the catastrophe. Moreover, the philosopher of Königsberg, then very young and having never left his native place, had taken as facts many fables which geologists would not stop to discuss in the present state of science. Humboldt, whose authority in such matters was greater than that of Kant at the time we speak of, tells us, that after having emitted during three months a high column of smoke, the volcano of Pusto caused its action at the precise moment when, at a distance of 400 kilometers, the earthquake of Elobamba, and the eruption of La Moya, were the cause of the death of 40,000 Indians. But notwithstanding the great authority of Humboldt's name, we must not forget that communication was very difficult on the high lands of the Andes, and that the semi-barbarous population scattered over the said space of 400 kilometers, does not present very sufficient guarantees for exactness of scientific observation. It may be said, therefore, that the facts serving as a basis to the most generally adopted theory about the vibrations of the soil, do not possess the necessary authenticity, and that geologists can not be exempted from making direct observations.

One of the first questions of geography to be solved, is to inquire whether the regions of the earth's surface where earthquakes are most frequent, are distinguished from others by some special features in the form of their outline, or in the nature of their rocks.

[To be continued.]

A LITTLE BOY, who had been shipped on board of a vessel destined to go to China, could not be waked to go in a ship. He had lost his position by quitting from the New Testament the passage that no one "can serve two masters," and said that he did not want to go in a two-master either.

SOMEONE who you are making to sit, said an indignant parent to a fractious boy: "I am your master, sir!" "Well, what's to be done for that?" said young Impertinent: "that's me!"

Re-discovery of Broesen's Comet.

There are a few comets which receive short periods around the sun, and these few are subjected to so many dangers—acting amazingly under the continual risk of dissolution—that a certain interest attaches to the search for periodical comets and their successive approach to perihelion. Nearly twenty comets, which are recognized members of this class, only eight have been known to return at the predicted seasons, and one of these have hardly failed to put in an appearance at the appointed time, although all the leading observers in Europe sweep diligently with their telescopes over the region along which it is expected to travel. No one knows what has happened to this particular comet. Its path had not brought it near to any of the large planets. But a certain suspicion had already fallen on its character for consistency since, at its first visit, it had separated into two distinct comets under the very telescopes of observers. Another comet of the same class was watched during two revolutions and then vanished. But astronomers had an inkling in this case of the cause of this catastrophe, since it was known that Jupiter had introduced this stranger within the solar system, and it was recognized that this giant outer-comete was competent also to dismember the comet from the neighborhood of the sun. The majority of these comets, however, have disappeared from our ken without any assignable cause.

The comet whose rediscovery has just been announced was detected by Mr. Bowring, at Kiel, on February 26, 1846. It is not to be confounded with another comet also named after this astronomer, but which revolves in a much larger period. The comet we are now dealing with was found to have an elliptical path, and a period of revolution of about five and a half years. But it was not so favourably situated for observation as to enable astronomers to calculate its orbit with any great precision. It was not seen at its return in 1851, being hidden in the sun's light during the greater part of its path near perihelion. However, on its next visit, in 1857, M. Bruns, at Berlin, rediscovered it and recalculated its motion.

Again in 1862, Broesen's comet came and went undetected by astronomers. But during the last few weeks several of the leading Continental observers were on the look out for the wanderer. Almost simultaneously Bruns at Berlin, Schmidt at Athens, and Tempel at Marseilles, announced its discovery, and before many days had elapsed Bruns published an ephemeris of its path on the celestial sphere. From this ephemeris it appears that the comet has already entered the constellation Lynx, at the end of May, it will cross the Great Bear's Big Dipper, in the Middle of June it will traverse his hind feet, on June 26 and 27 it will traverse the conspicuous cluster of stars which form the Hair of Berenice, and during July and August it will pass slowly away across the field of the Herdman. During all this time it will be favourably situated for observation.

The comet has already been subjected to spectroscopic observation, though hitherto, we understand its light has not been strong enough to afford very satisfactory indication of its structure. It seems clear, however, that it shines by its own and not by reflected light.

There is one peculiarity about Broesen's comet which renders it comparatively safe from destruction. Its path is largely inclined to that particular plane in space near which all the planets travel. Thus there are only two points of its orbit at which it runs great risk of disturbance; one of these is the point at which it passes from south to north of the ecliptic plane, the other is the point at which it passes from north to south. The former point lies within the orbit of Venus, but far enough from that orbit to render the comet tolerably safe from the planet's influence. The other point lies outside the path of Jupiter, and awkwardly near to his orbit. Its absolute distance from the orbit is considerably less, and, indeed, far greater than the distance of the former point from the orbit of Venus. But then Jupiter is such a giant compared with Venus, and has been the ruin of so many comets, that if ever Broesen's comet should pass this critical point, when Jupiter is near it, it is more probable that that will be a catastrophe.

There have been some, indeed, who have supposed that Broesen's comet is no other than Lexell's, which had been buried out of the solar system by Jupiter in 1770. That Jupiter might, after playing with Lexell's comet for sixty years, have sent it again within the earth's orbit, is indeed possible; but Lexell has examined the subject too carefully for us to be permitted to doubt the justice of his conclusion that Broesen's comet is not identical with Lexell's.

Indeed, it is a singular circumstance that there are other comets besides Broesen's which have been mistaken for Lexell's. Amongst these are Faye's and De Vic's. Leverrier has shown, however, that none of them can be identified with Lexell's comet.

It remains only to be mentioned that there is a singular family likeness between the comets of short period. They all travel around the sun in the same direction, and the paths of all but Broesen's are but little inclined to the ecliptic. Even Broesen's travels in a path less inclined to the ecliptic than that of the asteroid Palisa. Then, again, the orbits in which they travel present a marked similarity of figure, the smaller axis being in nearly every case about five-eighths (roughly) of the greater. Quite a large proportion also of these comets have a period of about five and a half years, and an orbit just reaching beyond that of Jupiter. These peculiarities are far too marked (as any one will see who examines a diagram of the orbits) to be accidental.

There is another family of comets which presents a corresponding series of resemblances. This is a set of periodic comets whose orbits all extend a little beyond that of the planet Neptune. They all have periods of about seventy years, and are considerably inclined to the ecliptic, and all have oval orbits, so closely resembling each other in shape, though wholly different from the orbits of the inner family of comets, that it is not easy to distinguish one orbit from another.

It is a fact, however, that the facts serving as a basis to the most generally adopted theory about the vibrations of the soil, do not possess the necessary authenticity, and that geologists can not be exempted from making direct observations.

One of the first questions of geography to be solved, is to inquire whether the regions of the earth's surface where earthquakes are most frequent, are distinguished from others by some special features in the form of their outline, or in the nature of their rocks.

[To be continued.]

A LITTLE BOY, who had been shipped on board of a vessel destined to go to China, could not be waked to go in a ship. He had lost his position by quitting from the New Testament the passage that no one "can serve two masters," and said that he did not want to go in a two-master either.

SOMEONE who you are making to sit, said an indignant parent to a fractious boy: "I am your master, sir!" "Well, what's to be done for that?" said young Impertinent: "that's me!"

A DAY IN THE MOON.—A lame, awkward boy comes one morning to the door of the principal of a celebrated school, and asked to see him. The servant eyed his moist clothes, and thinking he looked more like a beggar than a schoolboy, said to him, "Come into the kitchen entrance. The boy did as he was bidden, and soon appeared at the back door. "I should like to see Mr. B." he repeated. "You want a breakfast, more like," said the servant girl, "and I can give you that without troubling him." "Thank you, and the boy," said the master, "I have no time to eat." "Well, I have no time to eat," said the boy. "I should like to see Mr. B. If he can see me." "Some old clothes, may be, you want," remarked the servant, again eyeing the boy's patched trousers. "I know he has none to spare." "and without regarding the boy's request she went away about her work. "I should like to see Mr. B. If he can see me." "Well, I have no time to eat," said the boy. "I should like to see Mr. B. If he can see me."

SPARE MOMENTS.—A lame, awkward boy comes one morning to the door of the principal of a celebrated school, and asked to see him.

The servant eyed his moist clothes, and thinking he looked more like a beggar than a schoolboy, said to him, "Come into the kitchen entrance. The boy did as he was bidden, and soon appeared at the back door. "I should like to see Mr. B." he repeated. "You want a breakfast, more like," said the servant girl, "and I can give you that without troubling him." "Thank you, and the boy," said the master, "I have no time to eat."

"Well, I have no time to eat," said the boy. "I should like to see Mr. B. If he can see me."

"Some old clothes, may be, you want," remarked the servant, again eyeing the boy's patched trousers. "I know he has none to spare."

"and without regarding the boy's request she went away about her work. "I should like to see Mr. B. If he can see me."

"Well, I have no time to eat," said the boy. "I should like to see Mr. B. If he can see me."

"Some old clothes, may be, you want," remarked the servant, again eyeing the boy's patched trousers. "I know he has none to spare."

"and without regarding the boy's request she went away about her work. "I should like to see Mr. B. If he can see me."

"Well, I have no time to eat," said the boy. "I should like to see Mr. B. If he can see me."

"Some old clothes, may be, you want," remarked the servant, again eyeing the boy's patched trousers. "I know he has none to spare."

"and without regarding the boy's request she went away about her work. "I should like to see Mr. B. If he can see me."

"Well, I have no time to eat," said the boy. "I should like to see Mr. B. If he can see me."

"Some old clothes, may be, you want," remarked the servant, again eyeing the boy's patched trousers. "I know he has none to spare."

"and without regarding the boy's request she went away about her work. "I should like to see Mr. B. If he can see me."

"Well, I have no time to eat," said the boy. "I should like to see Mr. B. If he can see me."

"Some old clothes, may be, you want," remarked the servant, again eyeing the boy's patched trousers. "I know he has none to spare."

"and without regarding the boy's request she went away about her work. "I should like to see Mr. B. If he can see me."

"Well, I have no time to eat," said the boy. "I should like to see Mr. B. If he can see me."

"Some old clothes, may be, you want," remarked the servant, again eyeing the boy's patched trousers. "I know he has none to spare."

"and without regarding the boy's request she went away about her work. "I should like to see Mr. B. If he can see me."

"Well, I have no time to eat," said the boy. "I should like to see Mr. B. If he can see me."

"Some old clothes, may be, you want," remarked the servant, again eyeing the boy's patched trousers. "I know he has none to spare."

"and without regarding the boy's request she went away about her work. "I should like to see Mr. B. If he can see me."

"Well, I have no time to eat," said the boy. "I should like to see Mr. B. If he can see me."

"Some old clothes, may be, you want," remarked the servant, again eyeing the boy's patched trousers. "I know he has none to spare."

"and without regarding the boy's request she went away about her work. "I should like to see Mr. B. If he can see me."

"Well, I have no time to eat," said the boy. "I should like to see Mr. B. If he can see me."

"Some old clothes, may be, you want," remarked the servant, again eyeing the boy's patched trousers. "I know he has none to spare."

"and without regarding the boy's request she went away about her work. "I should like to see Mr. B. If he can see me."